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TELEPHONY

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Each switching unit a masterpie
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"XY" Switches are mounted hor
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plastic dust covers permit observa
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Both swit
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STROMBERG-CARLSON'S "XY" SWITCH

STROMBERG Telephone CARLSON

STROMBERG-CARLSON Factory, General Offices: Rochester
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TELEPHONES, SWITCHBOARDS AND INTERCOMMUNICATION SYST
EQ

the Answer

TO DIAL SWITCHING PROBLEMS"

Among remarks overheard recently at telephone conventions:

"... fastest switch in the field!"
"... what! double contacts throughout the entire system?"
"... the XY Switch in its action moves with authority!"
"... the vertical wire-bank multiples will eliminate cleaning!"

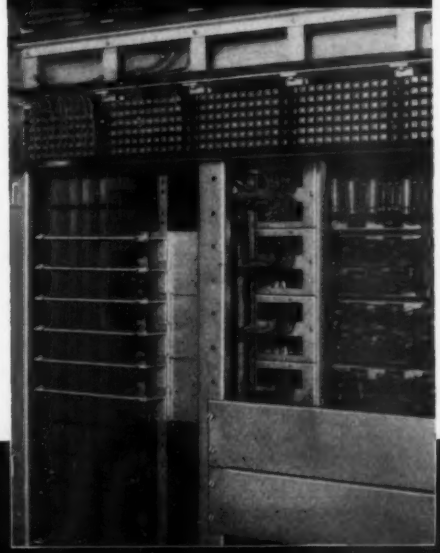
A study of this piece of mechanism proves these comments to be justified. It is a universal switch, as it can be used as a LINE FINDER, as a SELECTOR, and as a CONNECTOR. It accomplishes a connection first by the "X" motion *across* the switch and, second, the "Y" motion at right angles to it.

The "XY" Switch is smaller than others and, consequently, permits lighter and more compact switching equipment than ever used before.

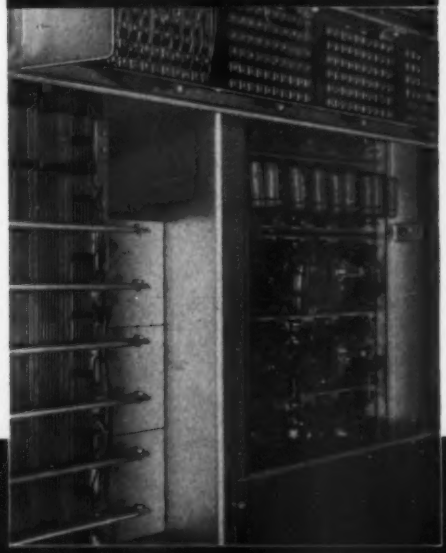
These factors, plus its many exclusive design features, have created unprecedented interest in the "XY" Switch. If you are considering new dial switching equipment, by all means investigate the Stromberg-Carlson "XY" Switch. We know what your decision will be!

Both switches and relay strips are of the plug-in type and may be taken out easily. Since both are removable units, this saves considerable time in servicing switches and relays, or in arranging for traffic loads.

Screw type line terminals and wiring of individual circuit plates are found in the rear of frame. Metal strips protect circuit plates from dust and the multiples are protected by a separate metal cover.



Bare wire multiple switch bank eliminates multiplicity of soldered connections from one switch to another. Easily removed and replaced. Each cell has two multiple supports to hold wire-banks rigidly in place.



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Offices: Chicago 6, Kansas City 8, San Francisco 3. In Canada: Stromberg-Carlson Company Limited, Toronto.

EQUIPMENT AND INDUSTRIAL SYSTEMS • RADIOS, RADIO-PHONOGRAPHS AND TELEVISION

Run Down This Partial List of Features

- ☐ All components easy to assemble or remove.
- ☐ Medium size screwdriver only tool needed to remove or replace housing or make any needed adjustment or adaptation.
- ☐ Same base plate for both desk and wall telephones.
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- ☐ Coil, condenser and circuit are "universal" — interchangeable in any 1000 or 1100 type Masterphone.
- ☐ 3-way switching unit in conjunction with universal coil simplifies control of transmission, reception and side-tone for long, medium or short loops.
- ☐ 2-way switching unit in conjunction with universal condenser furnishes all needed capacities.
- ☐ New, improved anti-side-tone Triad circuit.
- ☐ Permanently wired circuit nested in interconnecting block protection against moisture, dust, bugs.
- ☐ All essential terminations on top of interconnecting block.
- ☐ No complex wiring to disconnect or re-solder.
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- ☐ Ringer easily removable.
- ☐ Rigid ringer frame with flexible mounting keeps ringer in permanent adjustment.
- ☐ All ringers similar in design, adjustment and mounting — basic parts interchangeable.
- ☐ New felt-less, non positional transmitter.
- ☐ Receiver designed to furnish improved high fidelity response.
- ☐ Simplified inventory — a few components permit any type of service at all times.
- ☐ Modern-as-tomorrow styling.

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Greater Subscribe

WHEN YOU BUY

The New
KELLOGG
1000 SERIES
MASTERPHONES

If the only benefit you could expect from the new Kellogg Masterphones was the increased subscriber good will they will bring you . . . if these remarkable telephones were only "average" in other respects . . . you would still be more than justified in choosing them on that basis alone.

Just picture these new instruments in the homes, offices, shops and plants in your community. You'll hear plenty of compliments on their modern-as-tomorrow styling and refreshing new design . . . on the improved reception and transmission provided by newly improved receivers, transmitters and a Universal Anti-Side Tone circuit . . . on the pleasing, yet penetrating, tone of the newly designed ringer.

But the time subscribers will really appreciate these modern Masterphones is on the rare occasions when servicing may be necessary. Then, because of the simplified design and greater accessibility, your service man can open the telephone—replace a plug-in type condenser or coil—can even replace the entire one-piece circuit—and be on his way in a matter of several minutes.

Will a telephone like that build satisfaction among present subscribers—help you sell telephone service to more subscribers—help you build revenue? Of course it will. And together with the many other benefits (just check the list at the left) the new Kellogg 1000 Series Masterphones are your best bet by far. Order today for earliest possible delivery.

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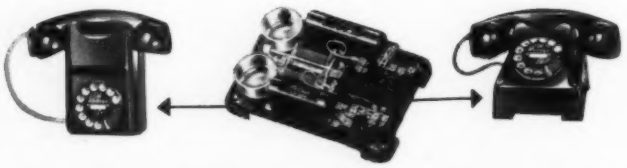

Both desk and wall Masterphones—for manual common battery, dial common battery or magneto service—use the same base plate. All components are mounted on the base plate and are easily accessible. Housings are changed in a matter of seconds.

UNIVERSAL CIRCUIT
Permanently wired, with all essential terminations on top of interconnecting block to simplify adaptation to many applications.

UNIVERSAL CONDENSER
Single condenser unit, in conjunction with simple 2-way switching unit, satisfies all circuit applications.

UNIVERSAL INDUCTION COIL
Single common battery coil easily zoned for various loops by merely changing a simple 3-way switching unit.

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The Satisfaction Lasts When You Buy Products

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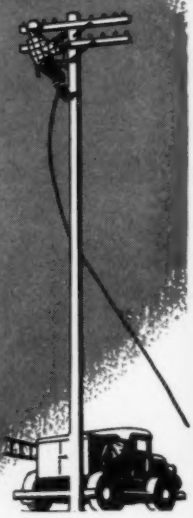

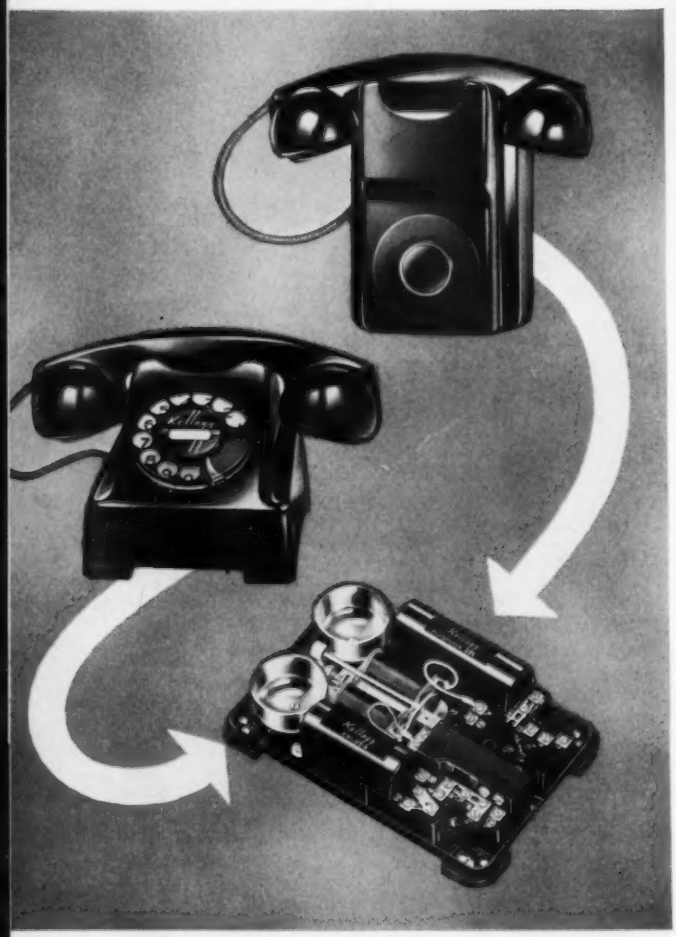

Simplicity is the keynote of the amazing new KELLOGG 1000 Series Masterphone. One base plate and two housings can be adapted to meet every subscriber need in either desk or wall types. All components are mounted on the one base plate—either screwed into position or plugged into the circuit like a tube into your radio. An ordinary screw driver is the only tool needed.

Dependable is the word that best describes "Eveready" "Columbia" "Gray Label" telephone dry cells. Dependable because they are manufactured by NATIONAL CARBON COMPANY, INC. under rigid laboratory controls that assure uniform high quality—extra days of service. Dependable because their sustained voltage means improved transmission.

There's three-way satisfaction when you concentrate purchases of line supply and construction materials at a single, responsible source: (1) The *quality* is right—all products are backed by the famous Kellogg DOUBLE GUARANTEE; (2) The *service* is right—orders are intelligently handled by experienced people; (3) *Delivery* is right—orders are shipped from the nearest of over 50 strategically located distribution points.

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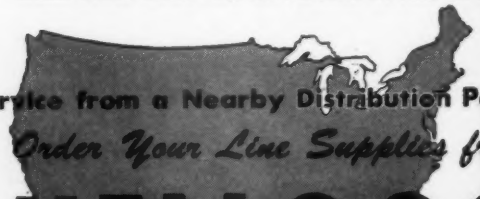

For Service from a Nearby Distribution Point

Order Your Line Supplies from

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FLASHES AND PLUGS

NEW TROUBLE MAKER! Telephone men can now add the airplane to the long list of known troublemakers. Although cases are rare, a small trainer plane recently managed to put a quietus on service provided over rural lines in western Linn County, Mo., where the lines were thrown out of service for several hours when an 11,000-volt transmission line was knocked loose and into the telephone wires by the plane.

• • •

NO HOG-CALLERS! Survey crews on the Colorado River control system, once proud of the leather lungs which allowed them to bellow instructions to each other almost a mile apart have bowed to science.

The crews are now equipped with walkie-talkie radio systems purchased from the Army.

• • •

MORE "WHAT'S IN A NAME?" TOWNS! A subscriber reading our list of Ohio towns bearing odd names published in this department April 6 sends in a list which includes these appetizing names: Pie, W. Va.; Cocoa, Fla.; Coffee, Calif.; Tea, S. D.; Cucumber, W. Va.; Tomato, Ark.; Toast, N. C.; Hominy, Okla., and Sugar, Idaho, and adds *"there are 28 cities and towns named Washington in the U. S. A.!"*

• • •

"TWARN'T NOBODY MUCH!" They were training Mandy in her duties as maid. Upon answering the telephone the first day she brought no message but explained:

"Twarn't nobody, jes a man says, 'It's a long distance from New York,' and I says, 'Yessir, it certainly is'."

• • •

CHEAPSKATES! The *Family Circle* reports that one Times Square office building is famous for the larcenous gents who cannot afford to rent offices and who squat in a pay telephone booth for hours in wait for the suckers to whom they have given the booth number as their own.

• • •

ALL IN A DAY'S WORK. A desk sergeant at a Minneapolis police station received a call that car 1365 was leaving the end of the line. The sergeant began to scramble to see if a new squad had been assigned to the district, and why it was leaving the end of the line, and what line. After making some inquiries, the sergeant discovered that a streetcar motorman had called in on a police call box instead of the streetcar dispatcher's telephone station.

• • •

ALL EARS! Perhaps one of the oddest and most highly skilled jobs in Canada is the man in the telegraph repeater stations in the big cities. All radio networks in Canada are carried on telegraph lines and must go through their stations. In the bigger places, one man sits with four radio programs going at once, listening to them all for noises and strange scratches that would not be detected by our ears. *Here are men who listen to four programs at once but don't hear anything that's being said.*

TELEPHONY

The Journal of the Telephone Industry

June 29, 1946

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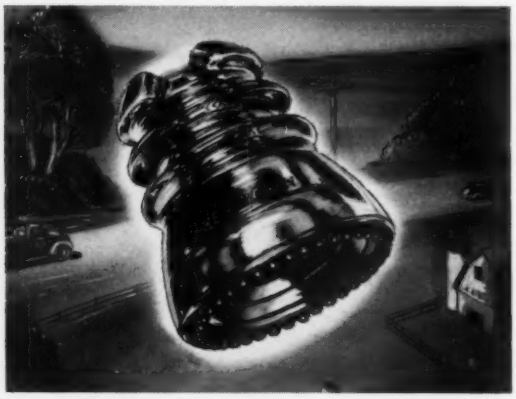
Sealed Against Trouble. Manufacturers of communication equipment insist on Kester Rosin-Core Solder for eliminating high-resistance joints and intermittent open-and-closed circuits. Remember to use KESTER SOLDER CO. Rosin-Core Solder throughout *your* telephone system.



All Firsts—No Seconds! Hemingray Insulators are moulded under *exacting* step-by-step quality production control. Every lot is *tested hourly* with precision instruments. That's why Hemingrays are so uniform, so dependable. Made by the OWENS-ILLINOIS GLASS COMPANY.

1 Spray Proof Vent Chambers. 2 High Acid Space. 3 Floté Plates. 4 Built-in Charge Indicators. 5 Hard Rubber Retainers. 6 Quarter-Sawed Douglas Fir Separators. 7 Super Braced Corner and Side Locks. 8. Supported Elements. 9 Steel Glass Jar (½ inch thick).
1
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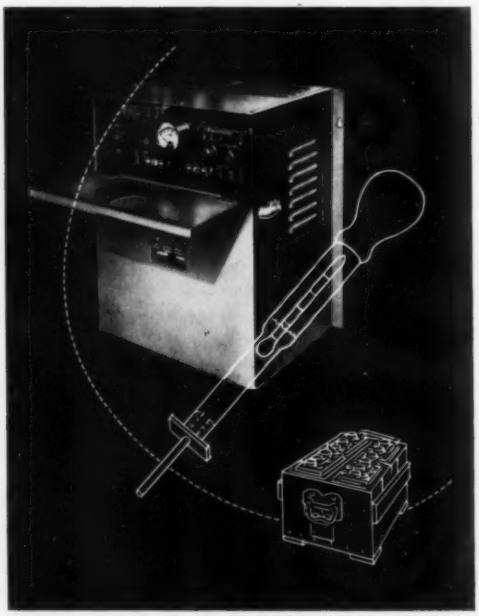
Modernize with Philco. For the latest in modern telephone battery design many e neers specify PHILCO Floté. Built into this battery are all the modern engineer features needed for today's full float service. In addition, every Philco Teleph Battery has the famous Floté grid that eliminates low cells, and measurably c tributes to operating efficiency, longer battery life and lower costs.

Plenty of Power—enough to sever 1¼ inch branches—is provided by this Pulley Type Tree Trimmer with compound lever and double leverage due to the pulley. Made by BARTLETT MANUFACTURING CO., this trimmer is available in single length poles or with pole in various sections.



Never Over, Never Under. The RectiChargeR automatic method of charging keeps batteries fully charged at all times and ends operating trouble caused by under-or-over-charging. That's why this RAYTHEON MFG. CO. unit is so popular with telephone men. It's a sure way to keep batteries "healthy" and assure long life.

Long Life Expectancy is built into pressure-t Southern Pine Poles and Crossarms. Ca and thoroughly treated by the AMERICAN C SOTE WORKS, INC., these poles have the durability required for dependable service the toughest climatic conditions.

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TOOL MAINTENANCE
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TYPE 7 HIGH POTENTIAL LIGHTNING ARRESTER. Outdoor pole-type arrester providing lightning protection and atmospheric static drain for five pairs of open-wire circuits, or for drop wires and cables leading to unprotected terminals. Equipped with: single-piece molded Bakelite insulation and fanning strip for strength and high resistance; non-corrosive metal hood, Everdur studs and galvanized mounting bracket for long service life; phosphor-bronze spring clips to accommodate Cook Tru-Gap non-grounding lightning dischargers.

Constant inspection and preventive maintenance ensure a good telephone system with a minimum of service interruptions. One of the secrets of Cook quality control is the preventive maintenance of each tool, die, jig and fixture. At the completion of each production run the last part fabricated is inspected under glass in the modern Cook tool room. If tool repair grinding or replacement is required, the work is undertaken at once.

This practice insures highest standards of quality, avoids delay in resuming production and helps deliver to you *more* and *better* Cook products *on time.*

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CHICAGO 14, ILLINOIS

Rural Line Service

By John D. Taylor CONSULTING ENGINEER

[EDITOR'S NOTE: *The author, in this installment, covers in detail the inspection and replacement of line wire. The evils of high resistance splices are discussed. Low insulation, its tests and elimination, are explained. Power line crossings, crosstalk and noise tests, subscriber station sets, tests points in rural lines and a general maintenance plan also are discussed.*]

* * *

PART IX. Maintenance, Continued. The eighth article in this series appeared in the May 25 issue, page 21.

(1) Construction. Line wire may be galvanized iron, mild steel, high tensile steel, copper steel (Copperweld) or hard-drawn copper. For rural service, galvanized high tensile telephone line wire, as listed above, is now being used extensively and probably will be increasingly employed in the future for the longer span construction because of its margin of strength under storm loads and the economies secured in pole costs.

It is important that whatever type of wire is used, it be strung initially and maintained according to the appropriate sag and tension tables which are available from any of the manufacturers of the particular wire being used. Some deviation from the sag tables and in sag differences may be permitted before it is necessary to pull slack, but generally the deviations should be small, if trouble is to be avoided. (For tables see TELEPHONY, April 27, page 26.)

Not only is proper sag necessary to avoid excessive wire breaks (not enough sag) or too many swinging wire contacts (too much sag), but of equal importance the pole line is relieved of abnormal longitudinal strains for which allowance is not usually made in its design. Also, uniform sag assists in limiting crosstalk and noise in the circuits.

Too much emphasis cannot be placed on the care and precautions which should be taken to avoid injury to wire and its galvanizing, such as nicks and kinks, in handling and installing. Careful work initially will save maintenance costs later.

Tying in wire is an important operation and requires not only careful workmanship, but the correct type of tie and tie wire as generally recommended by the maker of the line wire used or as determined by experience. The longer span construction (over 200 ft.) generally requires special tying to reinforce the line wire against stresses and abrasion from vibration and to anchor it securely to the insulator to withstand both normal and storm loads. It has been found that a large part of the wire fatigue or cold weather breaks occur at the insulator or tie due to stress concentration at this point.

A good grade of line wire insulator should be used on rural circuits to withstand the usual stresses and provide adequate insulation. Use of a poor grade of insulators will result in excessive breakage.

Splicing of line wire is now generally performed under normal conditions of construction and maintenance with rolled or pressed sleeves. This process of splicing insures a strong, non-corrosive joint which, if properly made, is as strong as the line wire itself. Twisted sleeve joints usually have less strength than the line wire and, because dirt and moisture work into them, eventually corrosion develops to the extent of causing a high resistance connection in many cases.

(2) Corrosion. While copper and copper steel wire are not appreciably affected by corrosion (except where the air is chemically charged) during its normal life, steel wire has a service life which depends to a large extent on the thickness of the galvanizing employed. A few years ago tests were made on samples of steel wire of different service ages, which samples were thought to be representative of conditions in rural areas. These samples had an 0.8-oz. zinc coating, which had disappeared in about 12 years, but the steel wire was not appreciably pitted until three years later. At about this point, the wire strength was decreasing quite rapidly and the wire resistance was increasing sharply. At the end of 20 years, the strength had decreased about 34 per cent and the resistance had increased about 50 per cent from the initial values.

Experience indicates that if the zinc coating were doubled, its life might also be doubled. However, in rural areas a very heavy galvanizing does not seem warranted, considering the average life of rural wire in the past. This view might change in the future with new developments in importance of rural circuits. Manufacturing data indicates that high tensile wire is given a heavy, dense and uniform coating of zinc.

Generally, rural line wire should be replaced when it begins to pit appreciably, which should permit a service life of at least 20 years. When replacing wire in a metallic circuit, both wires of the circuit should be replaced in the same section at the same time in order to maintain electrical balance. Good service cannot be expected from old, rusty wire, having little or no useful remaining life.

(3) Maintenance. The maintenance of aerial wire includes inspection and repairs for such items as:

(1) Insulator missing, loose or off pin or bracket.
(2) Slack or tight wire.
(3) Loose or broken tie wire.
(4) Temporary splice.
(5) Defective splice (when indicated by test).
(6) Kinks or nicks in wire (noted when working on wire).
(7) Insufficient clearance over highways or from poles or other objects and wires.
(8) Tree trimming.
(9) Corroded wire.
(10) Loose or defective bridging connector.

(4) High Resistance Splices. High resistance splices in wire are generally

the result of poor contact in the splice which may be due to a poorly made "hook" or "Western Union" splice or to corrosion or both. Where water and dirt work their way into the splice, corrosion will form sooner or later. One of the numerous advantages of the rolled or pressed sleeve splice is that it is weatherproof.

High resistances in circuits not only increase transmission loss, crosstalk and noise, but in common battery service it may make operation over a subscriber circuit impossible.

To test for high resistance connections of any kind in line wire, generally it is necessary to isolate the section of line to be tested from all intermediate DC bridges such as bridged ringers at stations, or bridged circuits at the central office. If these stations have a condenser in their line circuit, they are isolated for DC tests and such tests can be made from the central office or any point along the line.

Any resistance measuring device, such as an ohmmeter or Wheatstone bridge, will be satisfactory for taking the measurements. A short circuit is placed across the line at the far end of the section to be tested (if a grounded line, then a short circuit from the line wire to ground is required). Knowing the normal resistance of the line for the type of wire and the temperature at the time, also the length of circuit involved in the test, a comparison is made between the normal and measured resistance. This will indicate the excess resistance in the test section. By moving the short circuit in convenient successive steps toward the test set, a point finally is reached where no appreciable excess resistance is measured. By narrowing down the test section, the high resistance connection can finally be located. If more than one such connection exists in the circuit being tested, each such connection will be indicated as the short circuit is moved in steps toward the test set and by comparing the normal and measured values at each step.

The DC resistance of each rural line circuit should, if practicable, be checked annually or more often, as experience may indicate, in order to maintain the circuit resistance to each station within a few per cent of the normal value. This check is especially necessary for common-battery loops.

(5) Low Insulation. Low insulation in telephone operation means that the telephone circuit is not properly insulated between wires or between wires and ground. This condition may rise from moisture in cable, insulated bridle, drop or inside wire, from missing or defective line wire insulators, and particularly from tree contacts with the wires. The remedial measures required are obvious.

To test for low insulation in rural open wire, a 100,000-ohm high resistance voltmeter and 30 volts of testing battery usually will give sufficiently accurate results although a 50,000-ohm voltmeter may be satisfactory in some cases. For cable, unless the insulation resistance is so low that trouble exists, a megger reading directly in megohms is required.

The circuit under test must be free of bridged paths (other than the leakage being measured) and must be open at the distant end of the test section. The voltmeter and battery are connected across the circuit, usually at the central office, and then a reading is taken. Normal cable insulation should not be less than about 500 megohms per mile and rural open wire not less than 1,000 ohms for magneto and not less than 10,000 to 20,000 ohms per mile or more for common battery loops. Higher insulation is desirable to provide a suitable margin.

Where subscriber stations are equipped with condensers so that no DC bridges exist across the line, tests for low insulation should be made annually and during the summer period when the tree foliage is heaviest. Any tree trimming needed to meet insulation requirements can then be carried out under most favorable conditions.

The formula for computing insulation resistance by the voltmeter method is:

$$X = \frac{RL\left(\frac{E}{D} - \frac{1}{\ }\right)}{10^6}$$

Where:

X = Insulation resistance in megohms.
R = Resistance of voltmeter in ohms.
L = Length of circuit being measured in miles.
E = Voltage of test battery.
D = Deflection on voltmeter scale.

(6) Power Line Crossings. The requirements for strength of construction and minimum clearances between telephone and power wires and attachments at power line crossings or conflicts are set forth in Bureau of Standards Handbook No. 32, which is Part 2 of the Fifth Edition of the National Electrical Safety Code, entitled, "Safety Rules for the Installation and Maintenance of Electrical Supply and Communication Lines." These requirements must be met in case of crossings or situations of close proximity between telephone and electric lines except as modified by state or municipal regulations. It is suggested that every telephone company secure and be guided by the NES Code or local regulations in the construction and maintenance of telephone lines.

In some cases, more expensive construction at high tension power crossings can be avoided by placing the circuits under ground, rather than aerial, at the crossing; using lead covered cable or buried wire or drop wire, if the latter can be placed in iron pipe or other conduit.

(7) Crosstalk and Noise Tests. Crosstalk and noise in rural circuits should be checked periodically in connection with other routine tests. These detrimental effects may arise at any time due to unbalanced circuits or power line exposures. Actual measurements of crosstalk and noise may be made, if desired, as described in Parts V and VI of this series published in the March 2 and 16 issues of TELEPHONY. However, usually it is not necessary to make such tests as a routine on rural line circuits, since listening and talking tests with the subscribers will indicate if these effects are excessive and if further tests and remedial measures are necessary.

Subscriber Station Sets

The following items are the usual sources of trouble in subscriber station sets and require periodic attention:

(1) Dry batteries (not used on common battery talking loops).
(2) Transmitters.
(3) Receivers.
(4) Cords.
(5) Protectors and grounds.

Where it is desired to measure the resistance of a ground, whether at a subscriber station or other location, it can be done by using a Wheatstone bridge and two auxiliary grounds, e.g., two ground rods, in addition to the ground being measured. Three measurements are taken—one between each pair of grounds. Then, by simple triangulation, the resistance of the ground under test can be readily determined. Also, a low resistance megger (scale up to 600 ohms) can be used with the same auxiliary grounds mentioned above and the resistance read directly from the megger scale.

Since the above mentioned items of station maintenance, (1) to (5), inclusive, were discussed in Part VII, of this series in the April 6 issue of TELEPHONY they will not be mentioned further here.

Test Points

Most telephone operating companies which furnish switching service to service line companies and make connection with the latter's lines at the exchange city limits find that when

(Please turn to page 29)

Rural Plant Problems

By G. A. KLEIN
Plant Superintendent, Community Telephone Co.
Black River Falls, Wis.

ANY DISCUSSION of rural plant problems well might begin with the rural plant at the border of the initial rate area and work from there. If the rural lead is heavy, and by heavy I mean anything of 20 wires or more, certainly consideration should be given to the use of cable. There is no set rule that tells us just exactly when cable should be used. Each individual case must be studied. I sincerely believe, however, that no open wire rural lead of more than 20 wires should be replaced until a study has been made as to the possibility of cable proving in. Cost studies should be made of the proposed replacement, figuring it first with open wire and then with cable and you will be surprised how often cable will prove in over the open wire. This is especially true if the territory served by the lead is one that has possibilities of growth. In such cases, the cable offers the advantage of having additional pairs available to handle any growth that may be secured in the future.

In thinking about cable in the rural area, its size of course should be carefully considered. Most telephone engineers frown upon the use of any cable smaller than 25 pairs in size and do not recommend the use of a cable even that small, unless they are amply assured that it is large enough to handle any conceivable load in the territory with a sufficient safety margin to permit the replacement of any pairs lost by lightning or in some other manner.

Another thing to consider in the matter of cable for the rural area is the gauge. Cable smaller than 22-gauge seldom is used in the country since the problem of transmission loss is an extremely serious one for rural lines. Unloaded 24-gauge cable offers a loss of about 2.2 db. per mile, while 22-gauge cable has a loss of only 1.8 db. per mile and 19-gauge cable has loss of about 1.3 db. per mile. The total transmission loss in any rural circuit should be held to about nine db. in most exchanges.

Any appreciable length of small

G. A. KLEIN

gauge cable, it can be readily seen, will present a loss that will cut pretty seriously into the permitted total circuit loss. The loss presented by the cable can be reduced considerably by the installation of loading coils at prescribed intervals. These, however, are not usually used unless the cable is several miles in length.

In deciding on the gauge of a rural cable, the best method is to study the length of the longest lines that will work through it and estimate by the use of transmission loss tables just how much of a loss can be expected from its components. Iron wire offers a comparatively small loss. A .109 iron metallic circuit presents a loss of only .3 of a db. per mile as compared with 1.8 db. loss for 22-gauge cable.

The longest rural line can be studied and it might be found, for instance, that there will be a loss of possibly two db. in the initial rate area cable, one db. in the central office equipment and two db. in the open wire extending from the end of the proposed cable, making a total anticipated loss of five db. in addition to that offered by the proposed cable. If our permitted total loss in the circuit is nine db. we will have four db. left and will be able to afford that much loss in our new cable. If this cable is two miles long, we find that it should be of the 22-gauge size, since two miles of 24-gauge cable will offer a loss of 4.4 db. which is more than we can afford, while two miles of 22-gauge cable will offer a loss of only 3.6 db. which we can safely carry.

For an added improvement to service we then can cut the transmission loss to a point well below our permitted total loss by the use of loading coils if we so desire.

In the placement of new cable, many companies now fasten it to the messenger by use of a modern spinning machine and are finding the method satisfactory. Whether this method will entirely replace cable rings and other means of suspension, of course, only time will tell.

This new method of placing cable is still rather new but literature about it now is readily available and should be studied by all of us. Within the next year or two, no doubt, all of us will have gained experience with it and will know considerably more about it.

If our rural lead, as it leaves the initial rate area, is not heavy enough to warrant the use of cable, we will need to decide just what we will require in the way of open wire plant. Here it is well to mention that we also should not overlook the possibility of using buried wire. This type of rural plant is being extensively, and in many cases successfully, used by some companies and it may have quite a future in our industry.

If only one circuit is involved, the poles may be relatively small in size —Class 9 or 10 poles are quite sufficient. The wire probably will be placed on brackets and the poles spaced widely apart. We will find that by using modern, high strength wire we can space our poles at span of great length without deteriorating seriously the strength of our plant. Long span construction has been given, I know, serious thought by all of us. The day of 150-ft. spans for anything but the heaviest of construction is certainly

gone. I do not propose to say just how long the spans should be. I do know that with the Type 85 wire, a 250-ft. span is not long and I have seen many, many miles of it placed on poles as much as 350 ft. or more apart and as yet have encountered no serious fallacy in such construction. With the Type 135 wire, even longer spans are, of course, commonplace.

If the lead carries four wires, most of us follow the practice of placing them all on brackets. If more than four wires are involved in most cases crossarms are used and then a decision has to be made as to whether the crossarms should be of a 10-pin size or less. There is a decided objection on the part of many companies toward the use of anything less than 10-pin arms. However, in a rural area where it absolutely can be established that under no circumstances will the ultimate load require more than six or even eight wires, I believe it is perfectly sound to use six-pin crossarms.

There is a saving of about $1.15 per arm in the use of this smaller arm. There is a saving in labor both in placing and fitting. There are other savings—the small arm, by not extending so far from the pole, materially reduces the problem of overhanging private right of way. It also clears trees in better shape and permits a heavy reduction in tree clearance cost.

If the ultimate estimated load for the area exceeds six wires, however, 10-pin arms must be used and anything smaller is out of the picture.

I want to say something about anchorage in this discussion and possibly this is the proper time for it. No line is better than its corners and dead ends and we have found that the only way to economize on them is to build them just as strong as possible without any skimping. Too many times we all have seen an otherwise well-built lead spoiled by improper anchorage.

The anchor should be well away from the pole. I have seen—we have all seen—hundreds of anchors placed three or four feet from the pole when they could just as well have been 15 or 20 feet away and we have seen a pole buckle in the middle and lean the wrong way when, if the anchor had been placed properly, the pole would have remained straight and properly raked and the conductors, instead of being in a condition of impossible sag, would have remained at a proper and serviceable tension. I would like to emphasize that the cardinal rule of guying is to keep the anchor away from the pole.

If it is impossible to get a proper lead, then compensation for the shortage has to be gained by either increasing the size of the anchor, increasing the size of the guy or increasing the size of the pole. Our best poles should be the guyed poles and the closer the anchor is placed to the pole the larger the pole should be.

The MARATHON TELEPHONE TALKER
YOU MIGHT AS WELL GIVE IT TO ME. MAZIE COULDN'T LET WORK INTERFERE WITH HER TELEPHONE CONVERSATIONS
NOPE - ALL OUR WIRES ARE TIED UP WITH PERSONAL CALLS. JUST BE PATIENT-MAZIE OUGHT TO BE THRU ANY HOUR NOW.
SO I SEZ- "YOU DID"?- AND HE SEZ- "YEAH"-SO I SEZ.. BLAH- BLAH- BLAH-
MAZIE-COULD YOU -ER-SPARE SOME TIME TO DO SOME WORK?..
HASN'T THAT LONG DISTANCE CALL COME THRU YET?
I WONDER HOW MANY ORDERS WE'VE LOST FROM CUSTOMERS WHO COULDN'T CALL IN BECAUSE MAZIE KEPT THE WIRES TIED UP?
EVERY TIME MAZIE HAS A DATE, WE'D JUST AS WELL CLOSE UP TILL SHE GETS THRU TELLING HER GIRL FRIENDS ABOUT IT

—Courtesy of *The Breeze American*

There are a number of different types of anchors that are used successfully in rural areas. I believe all of us have discontinued the use of the old log or slug anchors in all but exceptional cases such as swamps where sometimes an anchor with a great area is about the only kind that will suffice.

The modern steel wing or screw type anchor is often used for rural guying. It is easy to install and its holding power is very good. Another type of anchor that often proves satisfactory is a round, molded, concrete anchor about eight inches in diameter. These anchors can be made locally at low cost and in most cases their holding power is quite sufficient for light guying. When heavy guying problems are encountered, however, I believe all of us find that one of the patent steel anchors of several shapes, sizes and descriptions is most satisfactory.

There are several methods of dead ending open wires. In the past it has been the practice of most of us to dead end our wire on wood brackets in the case of bracket leads and on pins when the wires were supported by crossarms. There always has been some objection to this method in that it was hard to properly support a wood bracket to handle the strain imposed on it by a dead end and the pins in the crossarms had a tendency to pull over and twist the arms out of shape after a period of time. I believe that either of two new methods will be found to be an improvement. The first is to dead end on small strain insulators which are fastened directly to the pole on a bracket lead and on a crossarm on heavier construction.

The second method is to dead end on insulated forks which are bolted directly to the pole or crossarm. Either of these two methods will prove satisfactory. The only disadvantage is that we cannot get quite the insulation from either of these dead ends that we get from the regular type of insulator. However, this deficiency, while it might prove noticeable on long and delicate toll lines, is not serious on rural lines.

These newer methods of dead ending are especially important in connection with long span construction where more than the ordinary strains are placed on dead ends and anchorages. While discussing the dead ending of wire, I believe it is well to mention the modern type of compression dead end sleeves. Those of us who have used these sleeves would dislike very much to go back to the older method of hand-wrapping the wires on dead ends. They offer a saving in labor and present a more substantial job than do the older ways. The neat appearance that dead ends made with these sleeves make, will be pleasing to any of you.

As we get farther into the rural area with our lead, we are apt to encounter more and more difficult right of way problems. Roads become narrower and more crooked. Tree conditions become worse and often times

the cost of building and maintaining a line along the public highway comes so comparatively expensive that some alternate route must be sought.

Many times it will be found that a route on private right-of-way will offer a considerable saving. Crooked lines cost money and maintaining right of way through heavy brush and trees also costs money. While the route of the line on private right-of-way may not be readily accessible to our trucks, a saving sometimes can be made of such proportions that we can afford to acquire a little inaccessibility. A part of the saving can be used to build the line a bit more substantial so that it can take a little more punishment. Its maintenance then becomes a smaller item and the problem of not being able to drive over it is not such a serious one after all.

In most cases where lines are placed on private property, easements should be secured so that we may have a legal right to leave and maintain them there. A very simple form of easement will suffice, merely a permit describing the location of the facilities and the route they take.

I know that there has always been a serious objection on the part of many of us toward leaving the public highway with our lines. We wanted them out where we could see them as we drove along and we were afraid that if we started paying for right-of-way, it might get out of hand to the point where we were paying more and more for more and more of it.

However, in these days of increasing material and labor costs, I believe that it will in many cases pay us to look into the private right-of-way situation. Often, indeed, we will find that we can eliminate a laboriously crooked piece of line threading its way through innumerable trees and heavy brush by relocating it along a nice, straight section line through a clear right-of-way.

I believe we often can take a lesson from the power people who believe in the old axiom that a straight line is the shortest distance between two points and build their lines that way.

In servicing and maintaining our lines, one of the principal sources of trouble is that of high resistance in the conductors. Possibly the worst offender is the old hand-wrapped connection in the line wire. These are more familiarly known as Western Union hand joints. While thousands of these hand joints have been eliminated there are still many of them left in service. Following the hand joint method came the double tube splicing sleeves which were used almost exclusively for a number of years. While occasionally one of these may be found that is high, such occasion is rare and we do not need to be concerned, for the present at least, with their removal.

The hand joints, however, are serious and the only way we ever will be relieved of the trouble they present is by their wholesale removal or elimination. We have found that the best way to remove them is to take a lead and to cut a section of it dead at a time. All of the wires in the section are cut dead and enough slack is cut into them to let them sag down to the ground. The joints then are removed and the ends of the wire are respliced with modern compression type sleeves. This method eliminates the need for cutting in slack at each connection.

We have also found that if the hand joints appear at frequent intervals and the wire is of any age, it often is cheaper to replace the wire than it is to remove the hand joints. After all wire is comparatively cheap and we cannot afford to spend too much time removing joints when less labor will replace the wire and give us wire plant that will be serviceable for many years to come.

For removing isolated single hand joints the long compression repair sleeve, which will permit the removal of the joint and the resplicing of the wire without cutting in slack, will be found very satisfactory.

In addition to the high resistance presented by the hand joints in rural circuits, we often find such conditions in other parts of the wire plant. One such place is the terminal pole where the bridal wire for the terminal is connected to the line wire. Most companies, in the past, have soldered the connections at this point; however, we often find conditions where they have merely been hand-wrapped on the line wire and when such is true, we invariably find trouble sooner or later.

The soldering of these connections makes a very satisfactory arrangement. However, there are several types of compression sleeves that can be placed on the wire before it is dead ended that are suitable for securely connecting the bridal wire. These sleeves are easy to install and they make an electrically perfect connection. Their use is worth the investigation of any company.

Another frequent source of high resistance is the connection between the drop wire and the line wire. Three methods commonly are used to make this connection. This first is to solder the connection. This method is satisfactory, its fault being that it cannot be opened for test purposes and reconnected without the use of solder. Often times a connection is opened when soldering equipment is not available and reconnection is made by simply hand-wrapping the drop wire to the line wire. This practice invariably will cause trouble.

The second method of making these connections is by means of test connectors. These connectors permit the connection to be easily removed and restored. They are entirely satisfactory if proper precautions are taken in their installation. We have found that some of the smaller types of connectors should be well covered with tape in order that they do not start to corrode.

The third method of connecting drop wire to line wire is by means of split "tap-off" sleeves. These sleeves were just coming into use before the war, and their manufacture was discontinued during the war years. They are again on the market and, if proven successful, should have a wide usage. They also are available in a size permitting a drop wire to be connected to an insulated paired line wire. Many of us have waited a long time for this for up until now there has been no satisfactory method of making this type of connection.

No discussion of this kind would be complete without spending some time in the matter of rural telephone instruments. I still believe that the magneto type of instrument will be with us in the rural areas for a long time to come. Many exchanges, including small rural exchanges, will be converted from magneto to dial or common battery service but there are countless others that will remain magneto for many years. A great many exchanges that are converted still will operate their rural lines with magneto service.

In my experience with rural telephones and in my discussions with many of our people, it is my opinion that the ideal magneto telephone for use on rural lines will have the following features: First, it will be in one unit just as the present standard magneto wall telephone. This will permit its easy installation. It also will eliminate the cases of trouble caused by faulty wiring between one unit and another such as the wire from desk ringer boxes to the dry cells. In addition, it will permit easy access to all parts of the instrument installation and will eliminate the need of traipsing all over the house in order, for instance, to replace the dry cells which I have seen installed in basements, closets and even attics.

Second, I believe the ideal rural magneto telephone should be equipped with a hand unit containing the modern highly efficient transmitter and receiver. This will permit the use of the

(Please turn to page 28)

IN THE NATION'S CAPITAL

BY
FRANCIS X. WELCH
WASHINGTON
EDITOR

British Labor Government's program for socializing the utilities and other vital industries not in danger of being defeated but it appears the average Britisher is beginning to wake up to the consequences of political endorsement of a socialistic program. . . . Welch takes in Louis-Conn *"waltz-time"* via television (on a free pass).

MORE detailed news is beginning to trickle back across the Atlantic about how the British Labor Government is getting on with its program for socializing the utilities and other vital industries. The word seems to be that it is getting on, all right; but there is plenty of squawking going on—a lot of it by people who voted the Labor party ticket to throw out Churchill's conservative government.

First, there was the program to socialize the Bank of England—which merely followed the footsteps of the United States and most other countries. In this respect, Britain's privately-owned central bank was almost unique. Less unique was her private coal mining industry, where production has been going down (per worker) and operating costs have been going up. The Attlee government figured that nationalization could step up production. The idea seemed to be that the miners who have been loafing on the job because they disliked producing for the wicked capitalist, would take up their picks and shovels with new vigor when they were mining coal "for the community."

Unfortunately for this pretty theory, just the opposite result seems to be emerging. Although nationalization of the mines has been a foregone conclusion for several months, production per worker is still dropping. The British miners, fired with the prospect of going on the public payroll, show no inclination to work any harder for that reason. In fact, the government has dispatched some experts to examine the admittedly superior American mining production methods to see if they can't import a little of our Yankee "know how" without taking the Yankee private enterprise system which goes along with it. This is rather an ironical development. But the British Labor Government sees nothing inconsistent or funny about it.

The telephone and telegraph industry in Great Britain has for many years been socialized — being conducted by the Post Office Department. But certain international cable and commercial radio services were still being operated under private ownership and thus fell into the net of Premier Attlee's socialization program. The House of Commons voted the necessary approval on this, despite a scorching protest from the Conservative benches led by grand old Winston Churchill himself. He criticized the government for a series of measures which, he said, could "lead to the dissipation of means by which more than half of our population live." He also roasted "the campaign of hatred and villification carried out on the part of one-half of the nation against the other half."

Now under Parliament's consideration are further plans to nationalize the British gas, electric and trucking industries. Last week in London, the Association of British Chambers of Commerce denounced the government's proposal to nationalize the gas and electric industries. At the same time, British electric companies proposed a five-year, five-point program pledging to consumers: (1) Ninety-five per cent area coverage; (2) lowest rates consistent with operating costs; (3) standardized rates; (4) standardized voltage and (5) abolition of direct current for residential service. In view of the large Labor majority in the House of Commons, observers do not see much chance of blocking the government's program, although the opposition is increasing steadily, particularly with respect to nationalizing the trucking industry. Some 30,000 truckers are raising such a storm of protest that even the government appears impressed.

In other words, while it is not reported that the government is in any political danger of having its program defeated (in view of Labor's overwhelming majority in the House of Commons), it does appear that the average Britisher is beginning to wake up to the consequences of political endorsement of a socialistic program. John Chabot Smith of the New York *Herald Tribune* reports in the following dispatch from London:

"Most of the people who voted for the Socialist government last year probably did not realize what they were letting themselves in for, and still have not really found out. When they do discover what a profound difference in the British way of life is in store for them at the Socialists' hands, there may be another and more determined struggle and a real effort to bring the issue of Socialism *versus* Capitalism squarely before the public for a final decision. But, for a number of reasons, that is unlikely to happen."

It is an inherent characteristic of a socialistic trend (often lost sight of in discussions about public ownership and nationalization programs generally) that a decision to embrace socialism is of an almost irrevocable nature. It is a fact that public ownership can lose time and again at the polls. But, it has to win once, and that is the end of private enterprise.

Viewed in this light, private enterprise is somewhat in the position of *Humpty Dumpty* on the wall. Once he is overthrown by a nationalistic movement, all the King's horses and all the King's men cannot put him back together the way he was.

Recall how you have heard occasionally about the government of this country, or that country, taking over this or that industry. The most recent example (outside of Great Britain) was the sale of the telephone properties of the International Telephone & Telegraph Co. to the former government of

Rumania, and also to the government of Spain. But when can you recall having heard about a government selling industrial properties *back* to private enterprise?

The reason for this one-way situation is that socialism is an economic as well as a political change. People thereafter are no longer confronted with a simple question of voting for this political party or that political party. With each additional step in the chain of nationalization, the prevailing party obtains so much more control over the commerce and the activities of the general population that it becomes more and more difficult for rival political parties even to organize, much less throw out the strongly entrenched socialistic government.

Furthermore, as the army of tax-paying public servants increases and the remaining retainers of private business decrease, the debate over government domination and control of public thinking becomes more and more of a lopsided contest. We have seen that end of this road. It is the mockery of the democratic process witnessed in European countries in the form of so-called plebescites, in which the real opposition is not even permitted to "field a team."

But have there ever been instances where a nationalistic trend was reversed? Let's look at our history books for that. We know that Socialism is anything but new. So, it must follow that, somewhere along the line, in the past, Socialism must occasionally have been sidetracked to give other forms of political and social organization a chance. In principle, Socialism is the descendant of the tribal system of prehistoric races of mankind. There were historical variations. It shifted to a form of complete sovereign ownership, asserted by monarchs or despotic rulers, such as the Khans of ancient Mongol, over the property and even the lives of all of their subjects.

Yet all history has yet to record a major instance, where a nationalization of private property was ever reversed within a brief enough time to return such property to the original owners. What happened, after the downfall of the old absolute monarchies, and certain agrarian movements, which in the past have confiscated private property, was that they had to continue on, to the point of absolute collapse or overthrow by hostile force (by enemy action or revolution) before any new system could be established. And that event simply set up a new class of property owners—small consolation to the original holders.

When the estates of the French nobility were seized for distribution by the Commune after the French revolution something like that occurred. The French Revolution had to continue to the point of collapse, from its own excesses, before the upstart Bonaparte established a new government, with a new class of privileged property owners of his own choosing.

We do not have here a very pleasant thought for those Englishmen (and others) who question the wisdom of a socialistic movement. Is the only way left open to correct such a trend, the harsh and negative remedy of letting it pursue its course to its own destruction even after its failure and shortcomings are apparent to everyone? Here is a sobering thought, even for those who believe in the wisdom and desirability of pushing the Humpty Dumpty of modern society off of his wall of free enterprise.

In other words, if the British (and perhaps later, ourselves) are impulsive about this now, the historical chances are good that many adults will not live to see the day when such an erroneous decision can be overruled. We Americans could, and did, repeal our "noble experiment" in national prohibition, by a mere constitutional amendment. But the solution would not be so easy in the case of an unsuccessful experiment in state socialism.

* * *

Last week your correspondent had a good seat to watch the Louis-Conn fight — or, the Louis-Conn Apache dance, if you prefer it that way. The visibility was perfect. The so-called fighters did not seem to be more than a hundred feet away.

Now, don't get the idea that your correspondent dashed all the way up to New York City and paid $100 for one of those ringside seats, out around the Yankees' second base. He is not in the habit of paying out large sums of cash, to witness single feature attractions. (In fact, it has been said that Welch would not pay 10 cents of his own money to see the Signing of the Declaration of Independence by the original cast.)

No, although the seats were superb, they were over 200 miles away from the scene of the fight. To be exact, they were in the Hotel Statler in Washington, D. C. As you have probably suspected — it was a television showing.

Your correspondent was the guest of the National Broadcasting Co., at a special telecast of the championship event. Each of the 700 guests had what was the equivalent of a ringside box seat.

Because of the use made of telephone facilities in this — probably the first large-scale, long-range television relay of an important event for a large public audience—readers of this department may be interested in a few more details. Not all of the 700 guests, which included cabinet officers, high dignitaries, etc. (pretty snobbish — eh?), were in the same room. For technical reasons, it was necessary to use 21 television receivers, each of which had a screen of 8½ x 11 ins. This, naturally, required the guests to be divided up into one score and one parties.

COMING CONVENTIONS

South Dakota Telephone Association, Hotel Carpenter, Sioux Falls, September 11 and 12.

Michigan Independent Telephone Association, Hotel Olds, Lansing, September 18 and 19.

United States Independent Telephone Association, Stevens Hotel, Chicago, October 14, 15 and 16.

Virginia Independent Telephone Association, John Marshall Hotel, Richmond, November 7 and 8.

North Carolina Independent Telephone Association, Pine Needles Hotel, Southern Pines, November 11 and 12.

South Carolina Independent Telephone Association (no hotel selected), November 14 and 15.

Alabama Independent Telephone Association, Jefferson-Davis Hotel, Montgomery, November 18 and 19.

Georgia Telephone Association, Henry Grady Hotel, Atlanta, November 21 and 22.

Florida Telephone Association, Marion Hotel, Ocala, November 25 and 26.

Nebraska Telephone Association, Hotel Lincoln, Lincoln, April 8 and 9, 1947.

But the clarity was amazing. It was not until the next day when the television guests heard the big-shot spenders, who threw away all kinds of money for a fleeting and blurred vision of two distant figures waltzing around in boxing trunks, that we realized how much better off we were than the cash customers. When Billy Conn hit the canvas for the count of 10 in the eighth round, it seemed to this observer that he was tumbling right into the lap of the Hon. Adolph J. Sabath, Ill., dean of the House of Representatives.

The telephone angle on all is the part that the relay from New York to Washington was made via coaxial cable manufactured at the Point Breeze plant of Western Electric Co. and operated on leased time by the National Broadcasting Co. by the Bell System. This type cable also carried the television signals from the Yankee Stadium in uptown New York to the RCA Building in mid-town for telecasting in the New York City area. The relays by coaxial cable were also made to picked guest audiences of the National Broadcasting Co. in Schenectady, and Philadelphia. NBC estimated the total video audience at 100,000.

Important Notice

TELEPHONY's book list, which appears on page 23, quotes new book prices effective July 1 and, therefore, supersedes all lists previously published, including the list on page 147 of TELEPHONY'S 1946 Directory of the Telephone Industry which went to press prior to receipt of these changes.

The style of announcement naturally varied from that of the ordinary radio broadcaster. This was because it was unnecessary for Bob Staunton, NBC's television sports announcer to make any blow-by-blow description. He merely supplemented what the audience could see for itself with unobtrusive comments on the bout. He did a good job, too, in this writer's opinion. Best of all he kept still during the few really active moments of the event.

The audience's reaction was interesting as compared with what was happening at the actual ringside. Some of the more spirited members at the hotel seance cried out exhortations for Billy Conn to "get on your bicycle" or for Joe Louis to "blow the man down!" By and large, however, the atmosphere was more restrained, but quite pleasant and informal. This may have been due to the air-conditioned rooms and the mint-juleps and other beverages and comestibles which were circulating freely. A number of greenback bills were seen to pass back and forth.

Altogether, the television version was so much more comfortable and satisfactory than the ringside that one is inclined to wonder whether television alone will mean the end of two-million-dollar gates for prize fights, or for any other really big sports event.

As Pat, a hotel policeman said, when it was all over: *"Why should I spend $10 or more in a hot seat to catch a glimpse of a big-mouthed Irishman getting his head beat up, when I can stay home with my own missus and see the same thing for nothing, right in my own house?"*

Telephone Folks

We take for granted the work of telephone people, linemen digging holes and stringing wires; heavy trucks hauling parts that go into the making of telephone service; the ringing of a bell that tells us we are wanted on the wire; the lifting of a receiver to hear the voice of neighbor or business man a mile or a thousand miles away; long distance conversation with London or Paris or Shanghai, or some other place on the other side of the world. We know that storms are not allowed to bring major interferences with telephone service. There may be a heap of broken poles and a tangle of wires where a cyclone blast has ripped them from foundation. In a few minutes, or at most a few hours, broken wires have been fastened together and the public forgets, if it ever knew, of the interruption.

Only 70 years ago this marvel of the engineering world was an experiment which its sponsors were not sure would be a success. It was. And from a few straggling wires tied to wobbly poles that strayed off into distance, the system has become one of the faithful representations of man's ingenuity. Invention and discovery have combined to alter the mode of transporting the human voice. No longer is it restricted to the extent of lung power. It races around the earth almost instantaneously, and men accept as commonplace the modern way of talking through space, even without the mechanical aid of wires. Continents are linked by wires and wireless that bridge the width of oceans, and span the reach of hemispheres. And the end of telephone expansion is out yonder beyond the present limits of progress.

A few men digging in the street to open space for placing a cable underground and others hauling away debris yanked from a shallow trench by a machine with steel claws. Others standing by to see that directions are followed in laying the case for cables and replacing the cover. Soon the surface of the street has been restored and the crew moved eastward. Lights atop heaps of earth and broken stone at night warn the public that men have been working, and the machine moves laborously on. The public pauses to inquire or ignores the work being done. It is a part of the system of improving telephone service, the part the layman sees. That part hidden away in the shallow trench, deftly hollowed from the hard street and as deftly covered, is beyond the ken of the unknowing. Telephone service is both a fact and an experiment after 70 years. The company pays engineers to search and search for new and better ways, and the public hears of their work only when an announcement is made.—**Owensboro, Ky., *Inquirer*.**

Double-Faced Invectives

The invectives against capital in the hands of those who have it are double-faced, and when turned about are nothing but demands for capital in the hands of those who have it not, in order that they may do with it just what those who have it are now doing with it.—**W. G. SUMNER.**

UP
and OVE

—and all by itself!

Here's one of the secrets of Strowger Automatic equipment — a feature that sets it apart. Each Strowger switch is a unit in itself, with its own contact banks, and wipers driven by its own power. It is virtually a switchboard in miniature — mechanically independent and self-contained.

Thanks to this "unit" design, Strowger equipment provides:

FLEXIBILITY — Standard Strowger equipment units can readily be combined to fit any building layout — to meet any service requirement. Throughout its life, the equipment can be rearranged as required, to meet changing conditions.

EASY GROWTH — A Strowger Automatic exchange can be built up to full capacity by simply adding switch units without disturbing equipment already installed. For further growth, new "frames" can be added, and equipped to provide additional service.

EFFICIENCY — Strowger Automatic equipment draws power only for the switches actually in use, and only *while* they are in use. Thus, its operating efficiency remains high, through all fluctuations in load.

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Only Strowger Automatic equipment provides all these advantages. No other equipment can promise better results for you — and none can back up its promise with an equal record of performance!

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THE PLANT MAN'S NOTE BOOK

BY
RAY BLAIN
TECHNICAL
EDITOR

THE following suggestion has been received from Walter C. Schroeder, district plant engineer of the Mountain State Telephone & Telegraph Co., Pueblo, Colo.:

"We recently experienced a serious service interruption when a 606-pr. jute-protected, buried cable was cut in two by a trenching machine. The cable was boxed in with 2 in. planking at the particular location where the damage occurred. The operator of the trencher felt his machine buck as it bit into the planking, but he kept the machine rolling until he observed the telltale bits of colored insulation and strips of copper wire which he then recognized as telephone wires. It was not until then that he realized what he had done and stopped the machine. Approximately 300 lines were out and 500 subscribers were without service over a period of 30 hours.

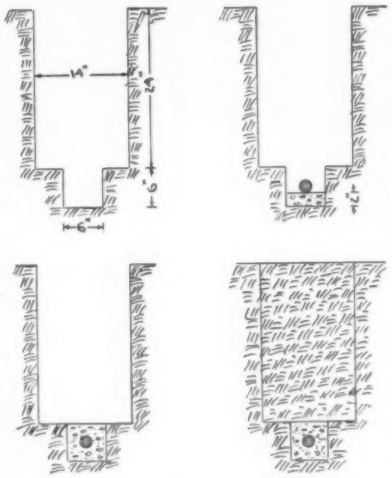
"In investigating troubles and service interruptions in buried cable installations, it appeared that most of them were caused by careless workmen or workmen who were ignorant of what they were doing. No vigilance on the part of telephone men or mechanical protection offered by planking placed over the cable was sufficient to prevent troubles in this class of plant.

"In seeking an answer to this problem it seemed to me that concrete protection could be used in very much the same manner as it is used to protect underground clay or tile conduit runs. If an underground conduit run is sufficiently important as to require this type of protection, a buried cable run should warrant similar protection.

"The accompanying sketch shows a suggested method of encasing a buried cable in concrete. A narrow trench is dug just wide enough to permit a workman to excavate to a depth of from 24 ins. to 30 ins., and then a smaller trench approximately 6 ins. by 6 ins. is dug at the bottom. A 2 in. layer of concrete is poured in the smaller trench and the buried cable placed or pulled in on top of it. The 6 in. trench is then completed, filled in concrete forming a 6 in. block completely encasing the buried cable. This type of protection should be very effective in resisting damage to the cables, and should do no injury to the cables themselves.

"It is my understanding that similar protection has been used in some parts of this country, and buried cables so protected have given uninterrupted service for over 15 years."

We would appreciate hearing from



METHOD FOR COMPLETELY ENCASING BURIED CABLE IN CONCRETE PROTECTION

any of our readers having had experience with cable protection of this type.

* * *

Esquire for July, 1946, carries an article titled: "Watch out for Wire Tapping" in which the use of telephone recorders and our telephone service in general is held up to ridicule. This article states in part as follows:

"It used to be that a gentleman could pick up a telephone and be fairly certain that he was talking only to the party on the other end of the wire, plus possibly a few telephone operators. Of course, there was some wire tapping. Sinister parties would hook in on other sinister parties, or the law would surreptitiously eavesdrop by wire on suspected wrongdoers. Wire tapping eventually was outlawed by the curious process of reasoning that we apply to so many other noble things in this fair land. By ruling that wire tapping was illegal the law handicapped only itself. Wicked persons continued to tap wires.

"Of more intimate interest to our law-abiding citizens is a novel form of wire-tapping addiction that makes a fellow queer for tapping his own wires. This psychoneurosis, not long ago, reached the stage where the Federal Communications Commission was called in to determine whether a businessman had the right to eavesdrop on himself.

"What got the FCC into this question of whether or not a person had the right to violate his own conversational privacy was a scientific jimcrack for confusing people by making things simple. It was a phonographic device that, when wired to a telephone, would impersonally record conversations.

"At present the majority of your business telephone calls are from people who want to do something, or to people you want to do something for you. Yet the telephone is supposed to be a labor saving device.

"The telephone strikes taught a lot of people something new about their dependency on the telephone habit. Some who couldn't get calls through saved themselves considerable trouble and found that they weren't so badly off as they had expected. In a comparatively brief time, as strikes go, the feeling of relief from telephone dictatorship began to outweigh the inconvenience of restricted telephone service. It was a development alarming to the telephone company, the strikers and the holders of the blue chip, American Telephone & Telegraph stock. They all had an inclination to compromise."

This article was evidently neither written nor checked by anyone with the slightest knowledge of the telephone industry. Telephone recording has not and should never be confused with wire tapping. The statement regarding the relief of being without telephone service reminds us of the moron who liked to hit himself on the head with a hammer because it felt so good when he stopped. It is a blessing that few of these twisted meaning articles on the telephone ever reach the public print for they could do real harm to the industry.

* * *

To call SPRuce 7777 in Philadelphia, it is necessary only to dial seven sevens.

* * *

The Chesapeake & Potomac Telephone Co. installed about 6,500 telephones for rural families during 1945 in the states of Maryland, Virginia and West Virginia. Service is planned for an additional 58,000 families in this area during the next three to five years at a cost of approximately $10,500,000.

A newly developed loud speaking system is now available which operates in principle similar to that of the throat and vocal cords. Modulated sound is forced by compressed air to the speaker output with an effect similar to that of the voice except that it is amplified to the degree of fineness. The frequency range is approximately from 100 to 10,000 cycles, depending upon the system of acoustic loading. It is claimed that this speaker will operate effectively under all atmosphere conditions at a range of 3 miles plus.

PLANT MAN'S QUIZ

Q. When should an insulator be installed in a down guy on joint telephone and power construction?

A. An insulator should be placed in each guy which is attached to a pole or structure carrying any supply conductors of more than 300 volts to ground and more than 15,000 volts between conductors, or in any guy which is exposed to such voltages. This guy insulator should be located at least eight feet above the ground.

* * *

Q. Can electrically operated meters be used for making peg counts on a manual switchboard?

A. These meters can and are used rather extensively for keeping an accurate record of completed calls. Each position can be metered separately and special meters can be provided to count the calls handled by individual telephones. A few of these meters generally are provided which can be switched to any line on which a record of calls is desired. Meters also can be used to count calls completed on individual trunk lines.

* * *

Q. When switchboard cords are rebutted and repaired on the switchboard, what method is considered satisfactory?

A. Two methods of cord repair generally are considered satisfactory, i.e., the punched hole method and the solderless cord tip method.

With the punched hole method, a switchboard cord is repaired by removing the frayed portion at the plug and punching holes in the separate conductors with a special toll. Small crews then are placed through the holes to bind the conductors to the plug.

With the solderless cord tip method, the metal cord tips are clamped onto the conductors with specially designed tools. These cord tips are then attached to the plugs by small retaining screws.

* * *

Q. What voltage normally is used for the operation of switchboard lamps?

A. The most commonly used voltages are 12, 24, and 48. Lamps of lower voltage, such as four, six, eight or 10, are, as a rule, used in circuits where the lamp does not receive the full battery voltage, due to the fact that it is placed in series with other elements of equipment.

* * *

Q. What is the standard distance cable terminals should be mounted below the messenger strand on aerial cable construction?

A. This will depend to a great extent on local conditions, for terminals should always be mounted so as to permit proper clearance. The rule normally observed when local conditions will permit is to place the top mounting screws on flat type terminals 24 ins. below the strand. The top mounting screws of can top type terminals should be 30 ins. below the strand. This measurement will, in general, be satisfactory for 11 or 16-pair terminal, but may be increased, if required, for 26-pair.

Q. Are drop wire clamps considered better than wire ties and knobs for supporting parallel type drop wire?

A. Drop wire clamps have been used extensively for a considerable number of years by some of the larger telephone companies which, in general, consider them satisfactory. The clamp can be quickly and conveniently installed, which permits considerable saving in labor costs over the tie and knob method.

* * *

Q. Can harmonic ringing on a rural line be arranged to give full-selective service for eight parties?

A. This can and is being done in many sections of the country today although it is not as extensively used now as in the past. This may be accompished by connecting four differently tuned ringers between each side of the line and ground. The cord circuit on the switchboard then is equipped with a reversing key, so that any one of four frequencies may be placed on either the tip or sleeve side of the line to ground to ring the bell of the station called.

* * *

Q. What means can be taken to avoid the shattering of poles on an open wire line by lightning?

A. This trouble can generally be avoided by installing a wire (109 iron or larger) from the top of the pole to about a foot below the ground level. When new poles are being used, this ground wire may be stapled in place for the entire length of the pole.

The accompanying photograph shows recorders now in use at the UN Conference being held in New York City. These film voice recorders run continuously and record the entire proceedings. Parts, as required, are dubbed on disc records for the use of representatives requesting this service.

COURTS and COMMISSIONS

Michigan Bell's 1946 Income $11,750,000, Engineer States

An expert witness for the Michigan Public Service Commission estimated June 13 in the Michigan Bell Telephone Co.'s rate case that the utility's 1946 net income would be $1,500,000 more than the company expects.

The witness was Cyrus G. Hill, Chicago consulting engineer, who testified in Ingham County Circuit Court. The company is protesting a commission order directing a $7,000,000 refund for 1944-1945, and an estimated $3,500,000 rate reduction for 1946. (TELEPHONY, May 18, page 27.)

Mr. Hill forecast 1946 net income at $11,750,000, compared with $10,250,000 estimated by the company. He said 1946 operating expenses would approximate $55,250,000, compared with the company's estimate of $58,000,000, and declared the rate of return would be approximately 6.9 per cent, compared with the utility's estimate of 6.2 per cent.

The case has been in adjournment since May 9.

V V

New York and Massachusetts Companies Fight City Tax

The fight of Harrison, N. Y. to tax the New York Telephone Co. on its telephone equipment in the town limits for 1938 to 1942 inclusive was presented again in supreme court June 12.

Justice James W. Bailey reserved decision on motions by which the town and company seek judgment on the pleadings.

The company contends the assessments were improperly added to the 1945 assessment roll for 1946 taxes, and charges that the equipment, including 3,027 telephones, wires and other equipment, were not "omitted" property, which may be added by law, but property which the town had decided was not taxable.

The town replies that a court of appeals decision has established that the property is taxable and that ruling by Justice Frank H. Coyne in January, 1945, establishes the town's right to add the assessments to the current roll.

In Massachusetts, on the same day New York's Supreme Court heard arguments concerning assessments on equipment, the New England Telephone & Telegraph Co. from which the city of Springfield seeks to tax some $2,000,000 of central office equipment, was informed that the city had no right to such taxes.

The ruling was made by State Tax Commissioner Henry F. Long and the Massachusetts Appellate Tax Board, who backed the telephone company's contention that the equipment, which includes teletype machines, batteries, bell ringing systems, wire and poles, is not machinery, but rather equipment for transmitting intelligence.

The decision will be appealed by the city of Springfield to the Massachusetts Supreme Court.

V V

Bills Affecting Telephone Companies Pending in Congress

As Congress races towards adjournment, sometime in July, two bills of special interest to telephone companies were still pending on opposite sides of the Capitol Building. In the Senate, the Gwynne Bill to limit suits brought for back wages and other claims growing out of alleged violations of the Wage and Hour Law, marked time on the Senate calendar. Two attempts were made to take up the measure, but failed because of lack of unanimous consent. On the first attempt, Senator McCarran (D., Nev.) brought a surprise amendment, which would have extended the two-year-limitation to five years as suggested by the U. S. Attorney General.

This brought objection from Senator Taft (R., Ohio) who insisted that the Senate consider the bill only in the form reported out by the Senate Judiciary Committee, and as approved by the House of Representatives. Later on, Senator McCarran withdrew his amendment and Senator Taft withdrew his objection. But on the second attempt to take up the measure, another objection was made by Senator Tunnell (D., Del.)

On the House side, the proposed amendment to the Fair Labor Standards Act, suddenly sprang to life in the House Labor Committee. The committee voted to report the original Norton Bill to increase the minimum wage to 65 cents an hour. But there was some indication that an attempt would be made before the House Rules Committee to allow the House to vote on the question of substituting the Pepper Bill in the form reported to the Senate, but before the farm parity provision had been added by the Senate. In view of the nearness of adjournment, it was believed that the House Rules Committee might be unable to take decisive action, so as to permit either form of the measure to come before the House before the session adjourns.

V V

Orange, N. J., To Contest Charge on "Free" Telephones

The Orange (N. J.) City Commission June 18 decided it would contest any action of the New Jersey Bell Telephone Co. to charge the city for use of 27 "free" telephones provided to the city under an ordinance adopted June 17, 1896, by the then city council.

The telephones were provided for 50 years in consideration of the city's giving the company the right to use streets for installing telephone equipment. A contract on the agreement was signed June 26, 1896.

In a letter last December, Herbert R. Schooley, general agent for the company informed the commission the service would be continued from June 17 on at the company's "usual rates." The matter was referred to City Counsel Dzyer, who reported the commission had a right to renew the agreement.

Total cost for the service now provided free was estimated at $170.30 monthly.

V V

Arkansas Commission to Advise on Improved Service

The Arkansas Public Service Commission soon will extend its operations beyond the customary rate-fixing and

A Selected List of Telephone Books

Technical books and information assume greater importance as a means not only of better fulfilling our niche in the postwar effort but also of self-improvement. From this list of telephone books, with brief statements of their contents, employes may find one or more they will want to obtain for study and reference.

• ***How to Build and Repair a Farm Telephone Line*, published by Telephony Publishing Corp.**
Eight-page booklet, unbound, 25 cents per copy to non-subscribers of TELEPHONY; special prices available to subscribers and to anyone ordering 25 or more booklets. This booklet, well-illustrated with photographs and diagrams, tells what was done to place a run-down farm line in good condition to furnish excellent service. The text describes how to attach wire to an insulator, how to attach brackets, how to set a pole, how to string wire, how to make a splice, how to protect telephone line from power line hum, how tree branches touching wires hamper transmission, how to connect drop wire to line wire, how to attach drop wire to house, how to connect house line to telephone, and how to connect the ground rod. The materials needed for a farm line are also listed.

• ***Rural Telephone Trouble*, published by Telephony Publishing Corp.**
Four-page reprint of an article published in TELEPHONY giving 33 magneto telephone and line troubles most commonly encountered, with suggestions as to the most likely cause of each —whether in the telephone set, the protector, the line, or the central office. Cost is 25 cents per copy to non-subscribers of TELEPHONY; special prices available to subscribers and to anyone ordering 25 or more reprints.

• ***Fundamentals of Telephony*, by Arthur A. Albert (1943) 366 pages, $3.25. *(Price, effective July 1, 1946, $3.75.)***
This elementary book, intended for beginning students and for telephone workers, is devoted exclusively to telephone communication. The first four chapters present briefly the principles of electricity and acoustics upon which telephone practices are based. The book then considers the following subjects: Telephone transmitters, receivers, telephone sets and circuits, telephone lines, manual telephone systems, dial telephone systems, loading, telephone measurements, noise and cross-talk, and repeaters and carriers.

• ***Electrical Fundamentals of Communication*, by Arthur L. Albert (1942) 554 pages, $3.50. *(Price, effective July 1, 1946, $4.00.)***
This book deals with fundamentals of electricity as applied to communication, including telegraphy, telephony, and radio. Contains basic electric circuits and phenomena using illustrations, terminology and problems from communication industry standpoint. Contains tables and 359 excellent drawings; is non-mathematical and clearly written for communication people having little or no college training. Especially suited for use in telephone training courses for new employes. Also valuable for employes who wish to extend their knowledge of electricity. A summary as well as review questions and problems given at end of each chapter.

• ***A Telephone Rate Case*, by Edward D. Smith (1941); 223 pages $5.00**
Written simply and clearly by an attorney for a telephone company, this book gives a bird's-eye view of the general rate regulatory background, and then outlines the steps for preparing a telephone rate case. Company executives as well as legal counsel dealing with rate matters will find much valuable and helpful information in the book. There is a comprehensive table of case references.

• ***Soldering for Workshop, Farm and Home*, by John Bonert (1941); 111 pages, 28 illustrations $1.25**
Valuable soldering information for telephone plant men, particularly apprentices, is presented in this book written by a telephone man with years of practical experience. The book discusses soft soldering, fluxes, tinning, soldering coppers, wire splices, soldering on lead, closing seams in a split cable sleeve, soldering and sweating with a torch, joints, hard soldering or brazing, construction of a soldering copper holder and pad, etc. No scientific terms or complications have been used in the book, which is intended to help the beginner or to refresh the memory of an experienced worker.

• ***Electrical Communication*, by Arthur L. Albert (1940): 534 pages (second edition) $5.00**
Presentation of electrical theory of communication, including vacuum tubes, networks, filters, and discussion of entire industry. Various subjects considered as related to one another in modern communication systems. Designed as a college textbook and reference book for those having technical training. Others will find much of value in it, as use of mathematics has been limited but not at a sacrifice of engineering exactness.

• ***Transmission Networks and Wave Filters*, by T. E. Shea (1929); 470 pages $6.50**
A specialized book which deals with principles of transmission networks, electric wave filters, and composition of transient waves. It is intended for student engineers or graduate engineers.

• ***Radio Operating Questions and Answers*, by Nilson and Hornung, 400 pages, $3.00. *(Price, effective July 1, 1946, $3.25.)***
This is a technical review book on radio communication for prospective and experienced radio operators of all classes, especially those about to take FCC license examinations. It condenses in question and answer form theory, apparatus, circuits, operation, laws, regulations, etc.—all the information covered in the new form of government examinations. Pocket size, flexible.

• ***Fundamental Electronics and Vacuum Tubes*, by Arthur L. Albert (1938) 422 pages $4.50**
The increasing use of vacuum tubes in telephone work makes this non-mathematical book of practical value to persons in engineering and operating branches of telephony. The book discusses the principles of electronics and the theory of vacuum tubes, photocells and copperoxide varistors in telephone circuits and radio. It delves into the theory of these devices and the design and operation of circuits in which they are used.

• ***Electrical Engineers' Handbook*, electric communication and electronics, volume 5, by Harold Pender and Knox McIlwain (1937); 878 pages $5.00**
This reference book for communications engineers contains engineering data and formulae concerning modern networks. Discussions are presented of telephone circuits (local, toll and program facilities), radiotelephone systems, and high frequency transmission, profusely illustrated with line drawings as are the other sections. These sections include acoustics, telegraphy, sound-reproduction systems, facsimile transmission, television, electronic control and navigation equipment.

• ***Communication Engineering*, by W. L. Everitt (1937): 727 pages (second edition), $5.00. *(Price, effective July 1, 1946, $5.50.)***
Book designed for engineers and those with technical training; gives fundamental principles of telephone, telegraph and radio communication without going back to the beginnings of the entire electrical engineering field. Transmission networks and circuits, involving coupled circuits, impedance transformations, equalizers and bridge circuits are treated. Inductive coordination is discussed with the latest theories for minimizing interference. Discussion is given of other links in the circuits which make possible radiotelephony or carrier-current systems, including vacuum tube detectors and amplifiers. Mathematical ideas beyond calculus, are introduced just before they can be applied

• ***Inductive Coordination of Electric Power and Communication Circuits*, by Laurence Jay Corbett (1936); 161 pages $1.75**
This excellent book discusses the nature of power transmission and of communication transmission, the effect of magnetic and electric induction and various influence factors. Susceptiveness and coupling factors, effects of conductor arrangements, transpositions in power and communication circuits and their coordination, power system wave shape, control of residual voltages and currents and many other phases are discussed. This book should contribute to a fuller understanding by power and communication engineers of each other's problems.

• ***Telecommunications — Economics and Regulation*, by James M. Herring and Gerald C. Gross (1936); 544 pages, $5.00. *(Price, effective July 1, 1946, $5.50.)***
Dealing primarily with the economic and public service aspects of the communications industries, the major purpose of this book is to evaluate existing state and federal regulation in the light of the requirements of national policy, as determined by the present federal administration. The subjects covered include the growth and development of the telegraph industry, submarine telegraphy, the telephone industry, the development and history of radio communication and broadcasting, state and Federal regulation of the communications industries.

• ***Telephone Theory and Practice*, by Kempster B. Miller (1933); 1414 pages, $15.00. *(Price, effective July 1, 1946, $16.50 for three volumes; $5.50 each volume.)***
A set of three volumes, "Theory and Elements" (1930, 468 pages, $5); "Manual Switching and Substation Equipment" (1933, 439 pages, $5); and "Automatic Switching and Auxiliary Equipment" (1933, 494 pages, $5). Volumes may be purchased separately or as a set. This series replaces "American Telephone Practice" by the same author, published early in the century. The set comprises an excellent source of accurate information of entire subject of telephony.

• ***Elements of Utility Rate Determination*, by J. M. Bryant and R. R. Herrmann (1940); 464 pages, $4.50. *(Price, effective July 1, 1946, $5.00.)***
Based on tested and workable methods, this book discusses factors, methods and problems of evaluating public utility property and service for rate-making. The essentials of valuation, depreciation, expense, return, etc., as factors in establishing proper rates for various utility rates are given. Citations presented from background and key cases decided by commissions and courts.

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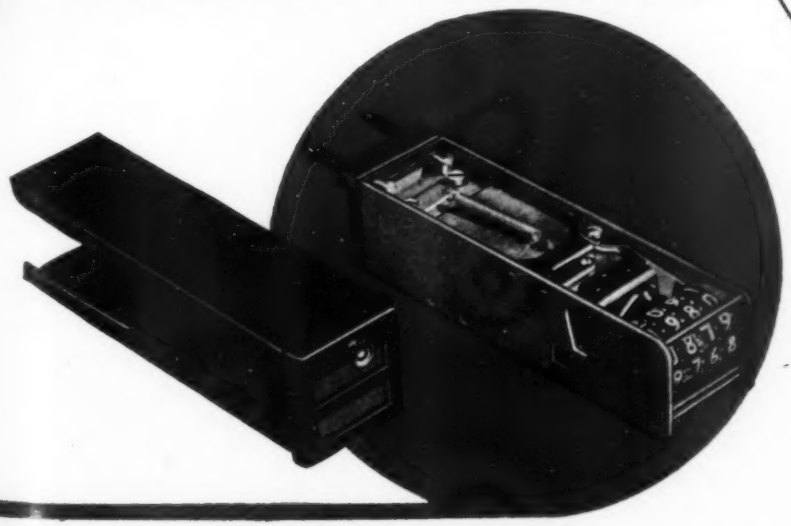

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regulatory functions into the consulting and advisory service field for both utility and transportation companies, Chairman Charles C. Wine, has announced.

"The commission's only function isn't to beat down utility rates," he said. "It must encourage and advise those companies under its jurisdiction to provide increasingly better service."

Commissioner Wine said first efforts of the commission in what he termed "purely missionary work" will be directed to improvement of services by the 127 Independent telephone exchanges in the state.

"There is a definite possibility that by improving their services those smaller companies can get better rate schedules," he declared. "This commission has never been opposed to rate increases where services rendered justified them."

V V

Rules Against One Utility Invading Field of Another

Upholding an order of the Nebraska State Railway Commission denying a bus application, the Nebraska Supreme Court held that where one utility seeks to extend operations into a field already occupied, it must show that not only the public convenience will be served, but also that an actual necessity exists. The court said the object of the law in requiring such certificates is not only to protect those already occupying the field, but to protect the public as well, since unwarranted competition in the field of public utilities may be and frequently is harmful to the public interest as well as to those engaged in such competition.

The supreme court also held that such proceedings are legislative as well as administrative in character, and that the courts will interfere only so far as is necessary to keep the commission within its jurisdiction and protect legal and constitutional rights. It added that on an appeal to the supreme court from such an order, the only question to be determined is whether the commission acted within the scope of its authority and whether the order complained of is reasonable and not arbitrarily made.

V V

Conception Junction Company Sold to Mr. & Mrs. M. O. Morris

Possession of the Conception Junction (Mo.) Telephone Co. has been taken by Mr. and Mrs. M. O. Morris of Clyde, Mo., who recently purchased the exchange. Mr. and Mrs. Bernard Wiederholt will operate the Clyde & Farmers Telephone Association, formerly operated by Mr. and Mrs. Morris.

Mr. and Mrs. F. X. Clark were the former operators of the Conception Junction exchange.

V V

Southwestern Bell's License Tax Up 250 Per Cent

Occupational license taxes of three public utilities including the Southwestern Bell Telephone Co., serving Joplin, Mo., have been increased 250 per cent by the city council to increase city revenue by a total of $13,800 a year.

The annual licenses of the Gas Service Co. and the Southwestern Bell Telephone Co. were increased from $3,600 to $9,000 a year each. The occupation tax of the Joplin Water Works company was upped from $2,000 to $5,000.

V V

Summary of Commission Rulings and Hearings

Federal Communications Commission

June 11: Granted American Telephone & Telegraph Co. permission to accept collect calls between U. S. and Germany for six-month period.

June 12: Granted American Telephone & Telegraph Co., Long Lines Dept., authority to operate line of the Carolina Telephone & Telegraph Co. between Virginia-North Carolina State Line and Washington, D. C., to furnish U. S. Department of Labor teletypewriter exchange service.

California Railroad Commission

June 14: Hearing on request of Gilroy (Calif.) Telephone Co. for authority to issue stock.

June 14: Granted A. A., R. L. and J. N. Richardson, Richardson Springs (Calif.) Telephone Co., authority to transfer telephone property.

Illinois Commerce Commission

June 25: Hearing to show cause why Illinois Bell Telephone Co. should not reduce rates for intrastate service rendered in Rockford.

July 2: Hearing on request of Illinois Commercial Telephone Co. for authority to increase rates at all exchanges.

New York Public Service Commission

June 27: Heard petition of Tri-State Associated Telephone Corp., Port Jervis, for authority to issue certain mortgage bonds.

June 28: Heard request of Highland Telephone Co., Monroe, for authority to change rates and schedules.

Wisconsin Public Service Commission

June 27: Hearing on complaint of Ervin Jansen against Wisconsin Telephone Co. concerning extension.

June 28: Hearing on application of Commonwealth Telephone Co. for authority to install dial service and increase rates at Nichols. Continued from June 21.

Radio Program Salutes Marine Telephone Industry

A special radio tribute to the Marine Telephone Industry was given over Station KYW, Philadelphia, Pa., May 23 on the *Valley Forge Caravan* radio show. The show, under the sponsorship of the Adam Scheidt Brewing Co., Norristown, Pa., offers a nightly salute to one of America's industries to bring about a wider public appreciation of American Free Enterprise.

Stating that, "A lifeline to men at sea" was established in 1929 when commercial telephony became a reality between the United States and the S. S. Leviathan on its December crossing, the program traced the development of the marine telephone industry through 1935 when 30 ships were equipped to be connected to land-lines criss-crossing America through a receiving station at New York City.

"Since that time," the commentator said, "the service has increased immeasurably and is extended to all coastal ships, commercial fishermen and even craft on inland waterways. To meet requirements of smaller ships, yachts and boats where trained radio personnel is not available, low-powered ship-to-shore radio-telephone systems have been devised."

It was stated that these systems are pre-set to certain sending and receiving frequencies and a network of shore stations accepts the calls and completes connections through regularly established telephone company facilities. The war was responsible for creating many additional shore stations in America and was similarly responsible for great advance in marine telephone equipment.

V V

Southeast Missouri Company To Construct New Building

Construction of the new Southeast Missouri Telephone Co. building at Poplar Bluff, Mo., is expected to get under way within a short time, Tate Gillis, assistant general manager of the company announced June 1.

Application for construction permits for the building, which will cost more than $100,000 has been filed with the Civilian Production Administration.

The telephone company's over-all program calls for a completely new system, the total cost of which will be well in excess of a quarter of a million dollars. It will be a dial central office, complete new outside plant and new dial telephones for both local and rural lines. The new dial equipment, already contracted for, will be delivered in time to coincide with completion of the building.

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4420

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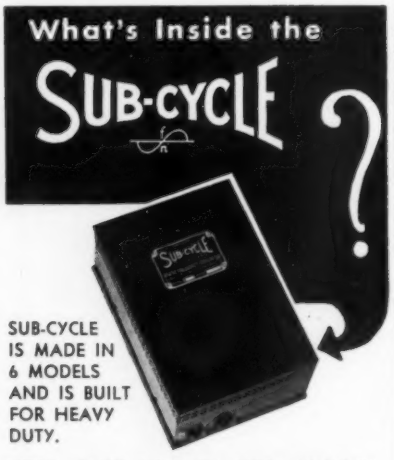
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Sold By Leading Distributors
LORAIN PRODUCTS CORPORATION
LORAIN, OHIO

Rural Plant Problems

(Concluded from page 14)

instrument while sitting down. Here there may be a little argument for it is well known that many rural telephone users hold the line a long time since in a great many cases the telephone serves as a substitute for a visit with friends to whom he is less accessible than the city dweller. It might be argued that by putting a hand unit on the rural telephone, we further will increase the holding time per message by permitting the user to sit or recline restfully while talking.

But it seems to me that it is a poor way to approach the problem of long holding time on rural lines to refuse to add to the comfort of the user. If that argument were carried a little further it might seem advantageous to increase the *discomfort* of our rural subscribers by possibly adding to the weight of the receiver so that in a short time the user would become so tired of holding it to his ear that he would only talk as long as absolutely necessary.

Of course that is utterly ridiculous. I believe that our rural subscriber is deserving of, and merits a telephone instrument equipped with a hand unit just as is his neighbor in town. If the use of such modern equipment increases the holding time on these lines to too great an extent, it only indicates that the rural user is getting just a little more value from his telephone, that he is using just a little more of the only thing we have to sell —telephone service—and that it might be a better approach to the problem to make the lines a little less heavily loaded so that long holding time would not seriously deteriorate the service to others on the line. It indicates that since he is using more service, he would be willing to pay a little more for it in order that the reduction in line loading would be financed properly.

The ideal magneto rural instrument should be as compact as possible. Modern high efficiency generators which are much smaller than the older type to which we are accustomed should offer themselves readily as a great help in solving the problem of size on these instruments. Another help would be a decrease in the size of telephone dry cells.

At the present time, one of the most serious problems in connection with our rural plant is that of expanding it so that it will take care of the thousands of pending installation orders. As to how many telephones there should be on a rural line, that is a question that deserves a great deal of time and consideration and I do not propose to discuss it at this time. However, I do know that no matter what standard we use in the matter of loading, many of our lines are over-loaded now and it is impossible to fill all or even a considerable part of our pending orders without loading our present lines to an impossible condition.

This means we will have to add many additional rural lines to our existing plant in order that we may both relieve our present lines and also take care of our pending orders. That means many of our rural pole lines will have to be strengthened so they may carry the additional burden placed on them, and many miles of bracket leads will have to be changed by the installation of crossarms.

As a help in the solution of this problem, I would like to call your attention to the use of phantom rural lines. I know that many of us, in the past, objected to their extensive use in that they require a little more maintenance than do physical circuits and are a little more susceptible to trouble. However, it seems to be that in these emergency times, when every hour and every bit of material counts in meeting our many problems, that if ever there was a time for this kind of circuit this is it.

It is probably not worth-while to install a phantom rural circuit unless it will save at least three miles of regular circuit. The side circuits of the group must be absolutely clear of grounds and free from high resistance joints. These side circuits may have telephones connected to them between the phantom circuit. However, no long branch lines should be connected to the side circuits between the coils because they will cause a reflection loss that seriously will unbalance the group. I believe in many cases phantom circuits can be used at least as a temporary expedient to help in meeting the problem of filling our pending orders.

I would like to say in conclusion that it always pays to make our rural construction just as good in appearance as we possibly can—that while to an ingrained telephone man almost any line is beautiful, to the general public those that do not have all the neatness we can put into them, may seem to be eyesores.

Rural Line Service

(Concluded from page 11)

trouble on a line develops, there arises the question of whether the trouble is on the switch line or company-owned line.

A test point at the dividing line of ownership is often of advantage to both companies in quickly locating and repairing the trouble. Where the "foreign" lines enter the exchange plant at a cable terminal, this terminal can be used as a test point. Where the junction of ownership is in the open wire, bridging connectors usually are provided and climbing equipment is necessary in testing unless the junction pole is stopped. To provide a more convenient testing arrangement, a weatherproof box, containing non-corrosive type of metal knife switches, can be mounted on the pole within easy reach from the ground. The "foreign" lines can then be wired through these switches and tests can readily be made from this point in either direction.

Maintenance Personnel

In Part VII of this series, the pooling of a maintenance fund by a number of small telephone companies (service line and others) for the purpose of maintaining their properties in good serviceable condition was mentioned. It would appear that such a plan is feasible, if say about 1,000 stations were to band together in the interests of having good, reliable service at all times, such as is given by the large companies. For example, assuming a reasonably good maintenance man could be employed for $150 per month, for 1,000 stations this would mean that each station would contribute 15 cents per month for salary, which is $1.80 per year. Materials required, such as batteries, could be charged directly to the benefitted subscriber or each company could prorate the total material used and other incidental costs per month for the good of all the stations involved. It would seem that such a plan to improve rural service could be developed.

The End

Telephone Poles Go Up

OPA announced 10 per cent increases effective June 15 in producers' ceilings for all Western red cedar poles and piling except split cedar hop poles. Telephone companies and other industrial users will pay the higher prices, OPA said.

K. B. Schotte, Independent Pioneer, Dies

Karl B. Schotte, one of the organizers of the Kittanning (Pa.) Telephone Co. 50 years ago and later its president and general manager, died June 8 at his home in Kittanning after a five-month illness.

K. B. SCHOTTE

Mr. Schotte was a director of the Pennsylvania Independent Telephone Association and the United States Independent Telephone Association and was a member of the Independent Pioneer Telephone Association.

Surviving are his widow, a son, three grandchildren and two sisters.

V V

Honor Retiring Operator of Rochester Telephone Corp.

Louisa A. Surridge, retiring operator, who joined the Rochester (N. Y.) Telephone Corp. in 1910, was feted at a dinner June 8 at which 175 fellow employes were present.

Miss Surridge became "official operator" in the area in 1916. At the dinner she was presented with a life membership in the Telephone Pioneers of America by C. C. Maddocks, past president of the Genesee Chapter of the organization.

V V

Agee Named Resources Head

JOHN H. AGEE, vice president and general manager of the Lincoln (Neb.) Telephone & Telegraph Co., has been named by the Lincoln Chamber of Commerce as chairman of a natural resources committee, specially created to do research work. The committee will study the various plans for development of the Missouri River Valley and the natural resources of the state in general, and determine the city's relationship to the problems that exist.

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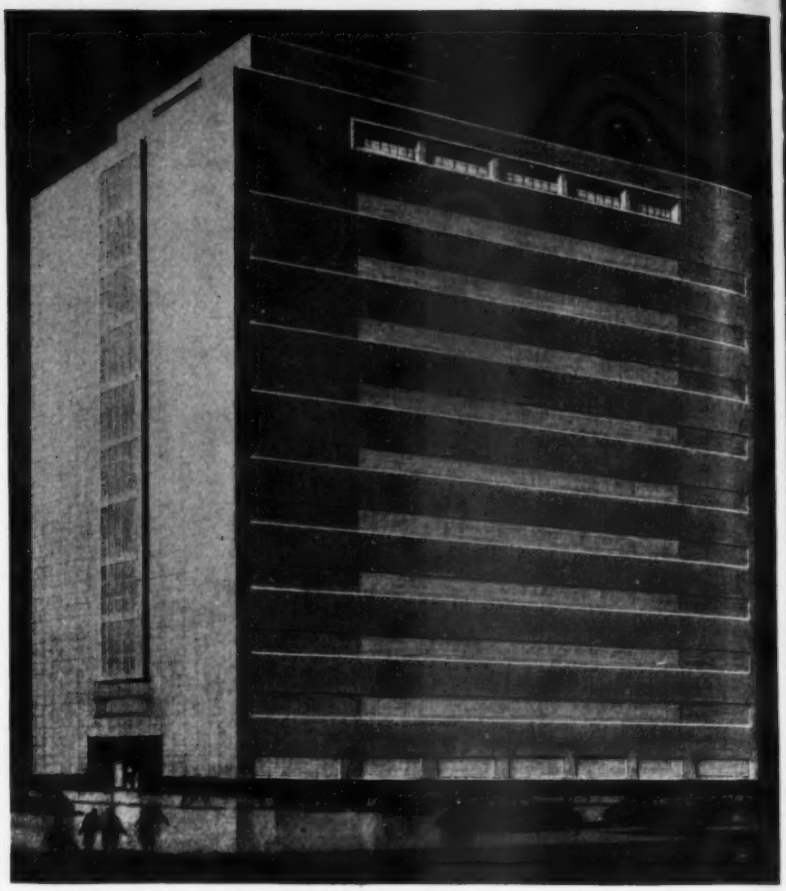


Artist's sketch of new Chicago toll office.

Stress Beauty and Utility In New Chicago Building

Streamlined exterior beauty is combined with such interior improvements as air-conditioning, fluorescent lighting and acoustical ceilings in the Illinois Bell Telephone Co.'s plans for a new 11-story building in Chicago, which, company officials announced May 19, has been approved by the Civilian Production Administration.

Chicago is the largest long distance switching center in the world and the new building will house its second long distance center.

Fire-resistive, the new structure will be approximately 148 ft. long and 100 ft. wide with a projecting wing 36 ft. by 43 ft. The framework will be structural steel set on concrete caissons to bedrock, and exterior construction will be brick and cutstone.

Together with initial installation of equipment and cable, the project will cost about 10 million dollars. It is part of the company's 160 million dollar, three-year expansion program which also includes such new improvements as faster long distance service, telephone service to and from moving vehicles; participation in a network of coaxial cable which will provide channels for television and additional telephone circuits, and more and better service for rural subscribers.

V V

Solem Succeeds West as Morrison, Ill., Wire Chief

Haldor Solem, Minneapolis, Minn., recently succeeded Frank West as wire chief of the Morrison (Ill.) Telephone Co.

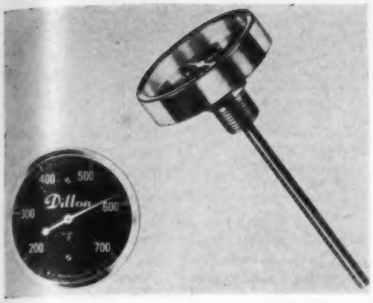
Mr. West, who has served the company for more than 25 years, will continue to give the organization the benefit of his knowledge and business acumen, developed in over a quarter of a century, in his new capacity of special service, and likewise will remain a member of the board of directors.

Mr. Solem served as wire chief for 10 years at the Wirthington, Minn., telephone exchange, leaving to take up duties in the interest of the war effort at Proving Grounds, Aberdeen, Md.

V V

W. C. Dillon Co. Announces New Thermometer

The W. C. Dillon Co., Inc., Chicago, Ill., has announced a new *stainless steel thermometer*, designed for all in-



dustry and said to possess numerous features that were not present in the company's original Temperometer.

The new thermometer is said to have an accuracy range of 1 per cent over the entire scale and it is stated that the accuracy is unaffected up to 50 per cent above 500 degrees F. range and unaffected up to 10 per cent above the 750 degree F. range.

Of all-metal, welded structure the pointer is fixed to a stainless steel shaft. The dial is made of anodized aluminum with white, heat resistant figures on a black background, and it is stated that the figures remain bright and legible indefinitely.

V V

American Coach & Body Has New Standard Utility Body

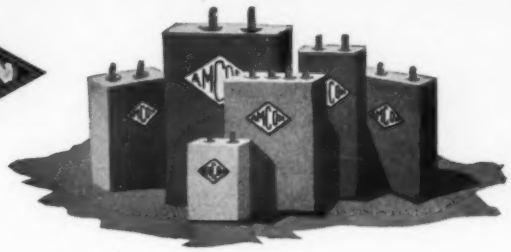
The American Gas Meter Installation Body, Type 4750, a standard utility body which can be mounted on a three-quarter or one-ton chassis now is available to gas utility companies. It is a development of the American Coach & Body Co. of Cleveland, Ohio.

This unit, of all metal construction and weighing 925 lbs., is 90 ins. in length and 72 ins. wide. It can be used for routine meter changing, general maintenance and repair work.

Side boxes and sliding tray can be equipped with meter compartments accommodating 31 gas meters or iron gas meters can be substituted if desired. Side boxes can be equipped with meter compartments which will hold seven (10-light) and seven (five-light) meters. Twelve (five-light) and five (10-light) meters can be carried in the sliding tray.

It is stated that meters are securely held in the meter compartments by individual elastic straps and each compartment is padded on all sides and

AMCON



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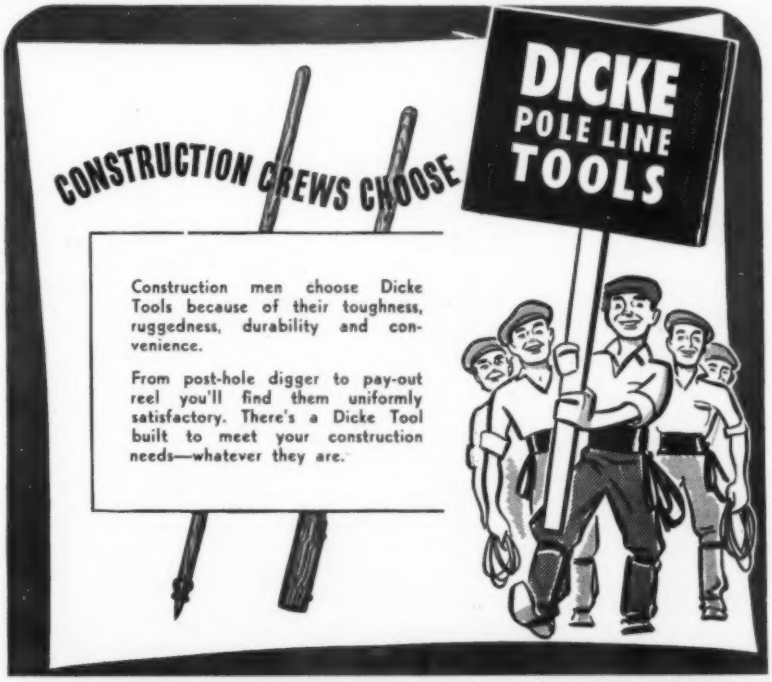
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bottom with special high-grade sponge rubber pads, held securely with pressed steel spot welded frames.

The lower compartments on both sides are equipped with bins for fittings of all sizes, tools and miscellaneous equipment. Provision has been made for a locker with individual door and lock inside of the upper right hand compartment. Up to 7½ ft. meter keys can be carried inside of compartment with access from rear of the body.

Optional equipment includes: (1) A sliding tray which is the full length of the body and located between the side boxes. When this tray is removed, the unit can be used for hauling gas stoves or refrigerators; (2) keyed locks for all doors; (3) a removable tarpaulin cover, above the side boxes or over the sliding tray only, for protection against adverse weather conditions; (4) a pipe carrier rack mounted on the left side of the body with light duty hold-down clamps, and (5) a pipe vise carrier bracket can be mounted on the right rear panel with disappearing pipe support bracket on the front panel.

Bodies can be purchased in prime or finished in standard colors, crated and shipped for mounting at destination, or can be mounted at the factory when chassis is provided.

Whitmore of Western Electric Takes Part in Bikini Tests

Will Whitmore of the Western Electric Co., New York City, sailed recently from San Francisco aboard the USS Avery Island, en route for Pearl Harbor and Bikini Island where he will take part in the electronic engineering activities in connection with the atomic bomb tests to be held this summer.

Mr. Whitmore is a member of the electronics staff of Capt. Christian L. Engleman, electronics coordinating officer, Joint Army-Navy Task Force One. Captain Engleman's group is responsible for all electronics activities connected with the atomic bomb tests. It is composed of engineers and electronics specialists from the Army, Navy, the air forces, and a number of commercial laboratories and manufacturing organizations.

Upon completion of his assignment with the Navy some time in September, Mr. Whitmore will resume his connection with the Western Electric Co. as its advertising manager.

V V

A. A. Wilcox to Manage Jobbing Sales for U. S. Rubber

A. A. Wilcox has been appointed manager of jobbing sales in the wire and cable department of United States Rubber Co., it is announced by H. H. Weber, sales manager of the department.

Mr. Wilcox has been associated with the company since 1937. He was formerly manager of industrial relations and industrial engineering in the company's wire manufacturing plant at Bristol, R. I.

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WANTED: Class A company in Illinois has openings for plant maintenance and construction men. Write Box 2292, c/o TELEPHONY.

WANTED: An experienced Strowger Automatic equipment installer. Splendid opportunity for man with ability. Give age, experience and references. Write Equipment Superintendent, Consolidated Telephone Co., Whittier, Calif.

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WANTED TO BUY: Telephone exchange from 500 to 1,500 stations in Illinois or Indiana. Have cash ready for purchase. Write Box 2291, c/o TELEPHONY.

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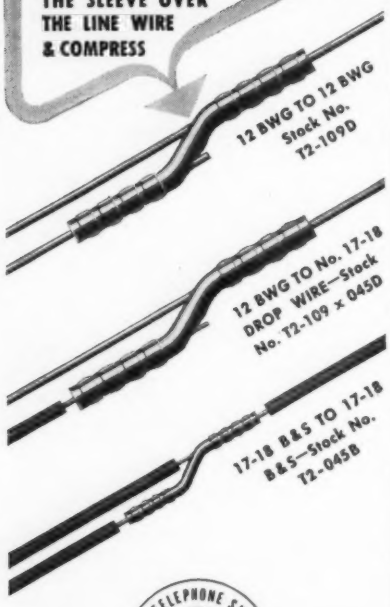

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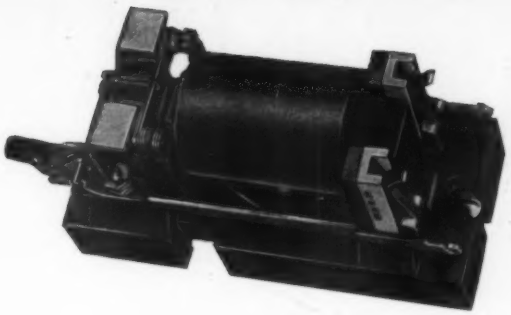

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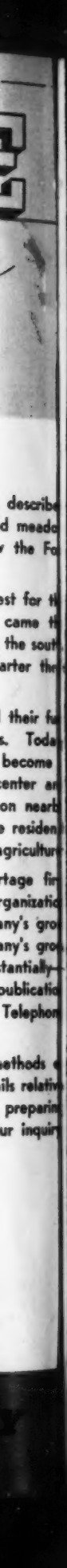
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